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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/342,789	06/29/1999	DAVID J. CORISIS	3384.1US	7096

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EXAMINER

GRAYBILL, DAVID E

ART UNIT PAPER NUMBER

2822

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/342,789

Applicant(s)

CORISIS, DAVID J.

Examiner

David E. Graybill

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 14-39 is/are pending in the application.
- 4a) Of the above claim(s) 7-11, 20-24 and 33-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 14-19, 25-32, 38 and 39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1-13-5 has been entered.

The reply filed on 1-13-5 is not fully responsive to the prior Office Action because it fails to conform to the provisions of MPEP 714.03:

37 CFR 1.111. Reply by applicant or patent owner to a non-final Office action.

(b) In order to be entitled to reconsideration or further examination, the applicant or patent owner must reply to the Office action. The reply by the applicant or patent owner must be reduced to a writing which distinctly and specifically points out the supposed errors in the examiner's action and must reply to every ground of objection and rejection in the prior Office action. The reply must present arguments pointing out the specific distinctions believed to render the claims, including any newly presented claims, patentable over any applied references. If the reply is with respect to an application, a request may be made that objections or requirements as to form not necessary to further consideration of the claims be held in abeyance until allowable subject matter is indicated. The applicant's or patent owner's reply must appear throughout to be a bona fide attempt to advance the application or the reexamination proceeding to final action. A general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references does not comply with the requirements of this section.

(c) In amending in reply to a rejection of claims in an application or patent under reexamination, the applicant or patent owner must clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. The applicant or patent owner must also show how the amendments avoid such references or objections.

Where a bona fide response to an examiner's action is filed before the expiration of a permissible period, but through an apparent oversight or inadvertence some point necessary to a complete response has been omitted - such as an amendment or argument as to one or two of several claims involved or signature to the amendment - the examiner, as soon as he or she notes the omission, should require the applicant to complete his or her response within a specified time limit (usually one month) if the period for response has already expired or insufficient time is left to take action before the expiration of the period. If this is done the application should not be held abandoned even though the prescribed period has expired.

Specifically, the objection to the drawings under 37 CFR 1.83(a) for not showing the claims 27-32, 38 and 39 embodiment comprising a paddle frame having no electrical leads for connection to a semiconductor device and paddle support bars; the 35 U.S.C. 112, first paragraph, rejections of claims 27-32, 38 and 39 for failing to comply with the written description and enablement requirements; and the 35 U.S.C 112, second paragraph rejection claims 27-32, 38 and 39, have not been addressed.

Because the response appears to be bona fide, but through an apparent oversight or inadvertence the response is incomplete, and in order to continue to afford applicant the benefit of compact prosecution, the requirement to complete the response is waived, the amendment is entered, and the claims are examined on the merits.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the features of claims 14-19, 25-32, 38 and 39 must be shown or the features canceled from the claims. To further clarify, the drawings do not show the claim 14 embodiment comprising a paddle frame having no narrow common electrical leads for connection to a semiconductor device and paddle support bars, and the claim 27 embodiment comprising a paddle frame having no electrical leads for connection to a semiconductor device

and paddle support bars. Also, the drawings do not show the claims 14 and 27 negative limitation, "the paddle support bars not used for electrical leads for the semiconductor die."

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 27-32, 38 and 39 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

The undescribed subject matter is the claim 27 embodiment comprising a paddle frame having no electrical leads for connection to a semiconductor device and paddle support bars. To further clarify, in the specification, page 6, lines 8-9, applicant discloses that the paddle support bars 24, 28 are electrical leads for connection to a semiconductor die because they are capable of being used for the intended use as electrical leads for connection to a semiconductor die.

Claims 27-32, 38 and 39 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The undescribed subject matter is the claim 27 embodiment comprising a paddle frame having no electrical leads for connection to a semiconductor die and paddle support bars.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 27-32, 38 and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 27, the limitations, "a paddle frame having no electrical leads for connection to a semiconductor die" and "paddle support bars" are mutually exclusive because, as disclosed in the specification as cited supra, the paddle support bars are electrical leads for connection to a semiconductor die because they are capable of being used for the intended use as electrical leads for connection to a semiconductor die.

In the rejections infra, generally, reference labels are recited only for the first recitation of identical claim elements.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to

which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 14-17, 25-30, 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakashima (5661086) and Fujimoto (5773896).

At column 6, lines 21-24; column 6, line 55 to column 7, line 1; column 7, line 62 to column 9, line 42; and column 11, line 1 to column 12, line 32, Nakashima discloses the following:

A semiconductor device assembly of a plurality of semiconductor device assemblies, comprising: a semiconductor die 14 having an active surface having a plurality of bond pads 13 thereon and an opposing second surface; and a paddle frame of a plurality of paddle frames 33 including a pair of side rails 31, a plurality of cross-members (not labeled but illustrated between 32, 32a and 34, 34a, respectively), and a plurality of generally centrally positioned paddles 12, the pair of side rails and the plurality of cross members connected to a generally centrally positioned paddle of the paddle frame by a plurality of paddle support bars 32, 32a, the second surface of the semiconductor die being secured to the paddle, the paddle being attached to the side rail by at least two of the plurality of paddle support bars and being attached to the cross members by at least two of the plurality of support bars; a substrate 17 having a plurality of circuit

connections 21, the plurality of bond pads bonded to the plurality of circuit connections; sealant packaging material 26 enclosing a portion of the semiconductor die and covering a portion of the substrate.

A semiconductor device assembly of a plurality of semiconductor device assemblies, comprising: a semiconductor die having an active surface having at least one bond pad thereon and an opposing second surface; and a metal paddle from a paddle frame having no narrow common electrical leads for connection to the semiconductor die of a plurality of paddle frames connected by a pair of rails having a plurality of cross members therebetween, the second surface of the semiconductor die being attached to the paddle, the metal paddle attached to at least one side rail by at least a plurality of paddle support bars and being attached to a plurality of cross members by the support bars, the paddle support bars not used for electrical leads for the semiconductor die; a substrate having a plurality of circuit connections, the at least one bond pad connected to at least one circuit connection of the plurality of circuit connections; sealant packaging covering a portion of the semiconductor die and a portion of the substrate.

A semiconductor device assembly of a plurality of semiconductor device assemblies, comprising: a semiconductor die having an active surface having a plurality of bond pads thereon and an opposing second surface; a

plurality of projections 25 connected to the plurality of bond pads for direct connection to a host circuit board 17; and a metallic paddle having no electrical leads for connection to a semiconductor die secured to the second surface of the semiconductor die, the metallic paddle being attached to at least one side rail by at least a plurality of paddle support bars and being attached to a plurality of cross members by the support bars of a paddle frame; a substrate having a plurality of circuit connections, the plurality of bond pads connected to the plurality of circuit connections; sealant packaging covering a portion of the semiconductor die and a portion of the substrate.

However, Nakashima does not appear to explicitly disclose at least one projection for flip-chip bonding to a substrate; at least one projection configured for flip-chip connection; wherein the plurality of projections comprises a ball grid array (BGA) of solder balls; wherein the plurality of projections comprises balls deposited by a wire bonding machine; and wherein the plurality of projections comprises a plurality of stud bumps deposited by a wire bonding machine.

Nonetheless, as cited, Nakashima discloses a BGA device. Moreover, at column 1, lines 11-16; column 7, lines 1-23; column 9, lines 12-25; and column 14, lines 1-4, Fujimoto discloses a BGA device having at least one

projection 22 for flip-chip bonding to a substrate 20; at least one projection configured for flip-chip connection; wherein a plurality of projections comprises a ball grid array (BGA) of solder balls; wherein a plurality of projections comprises balls; and wherein a plurality of projections comprises a plurality of stud bumps. Moreover, it would have been obvious to combine the disclosure of Fujimoto with the disclosure of Nakashima by providing both the projections of Fujimoto and the projections of Nakashima, because, as disclosed by Fujimoto, it would enable bonding of multiple semiconductor chips to "promote an effort to implement further miniaturized LSI semiconductor devices at lower cost."

Also, although Nakashima and Fujimoto do not appear to explicitly disclose the process limitation, "deposited by a wire bonding machine," the product of Nakashima inherently possesses any structural characteristics imparted by the process limitation. See *In re Fitzgerald, Sanders, and Bagheri*, 205 USPQ 594 (CCPA 1980).

Claims 5, 6, 18, 19, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakashima and Fujimoto as applied to claims 1-4, 14-17, 25-30, 38 and 39, and further in combination with applicant's admitted prior art.

Although Nakashima does not appear to explicitly teach an electrically non-conductive adhesive layer connecting the second surface to the metallic paddle; wherein the adhesive layer comprises one of epoxy and polyimide, at page 5, lines 11-20 applicant teaches that this product is well known. Furthermore, it would have been obvious to combine the well known product with the product of Nakashima because it would facilitate provision of the die 14 secured to the paddle 12.

Applicant's amendment and remarks filed 1-13-5 have been fully considered, are addressed by the rejections *supra*, and are further addressed *infra*.

Applicant contends that there is no motivation to combine Nakashima and Fujimoto.

This contention is respectfully traversed because proper motivation is elucidated in the rejection.

Also, applicant alleges, "A second semiconductor chip bonded to the die 14 with bumps of solder would cause potting resin 26 to protrude downwardly from solder balls 24, preventing reliable connection with the PWB. Therefore, there can be no reasonable expectation of success from the combination of the teachings of Nakashima and Fujimoto."

This allegation is respectfully deemed unpersuasive because it is unsupported by proof or a showing of facts; hence, it essentially amounts to mere conjecture. *Ex parte Gray*, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989) (statement in publication dismissing the "preliminary identification of a human b - NGF - like molecule" in the prior art, even if considered to be an expert opinion, was inadequate to overcome the rejection based on that prior art because there was no factual evidence supporting the statement); *In re Beattie*, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992) (declarations of seven persons skilled in the art offering opinion evidence praising the merits of the claimed invention were found to have little value because of a lack of factual support); *Ex parte George*, 21 USPQ2d 1058 (Bd. Pat. App. & Inter. 1991) (conclusory statements that results were "unexpected," unsupported by objective factual evidence, were considered but were not found to be of substantial evidentiary value).

In addition, applicant assert that the conclusion of obviousness is based upon improper hindsight reasoning. Indeed, it has been recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning; yet, so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was conceived, and so long as it does not include

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knowledge gleaned only from applicant's disclosure, such a reconstruction is proper. In re McLaughlin, 443 F.2d 1392; 170 USPQ 209 (CCPA 1971). To this end, it is respectfully submitted that these criteria are satisfied in the rejection of the instant invention.

The art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.

For information on the status of this application applicant should check PAIR:

Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alternatively, applicant may contact the File Information Unit at (703) 308-2733.

Telephone status inquiries should not be directed to the examiner. See MPEP 1730VIC, MPEP 203.08 and MPEP 102.

Any other telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (571) 272-1930. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.
The fax phone number for group 2800 is (703) 872-9306.



David E. Graybill
Primary Examiner
Art Unit 2827

D.G.

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